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With the companion  
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## BULLETIN No. 2

OF THE

ILLINOIS

STATE MUSEUM OF NATURAL HISTORY,

SPRINGFIELD, ILLINOIS.

DESCRIPTIONS OF TWO NEW SPECIES OF CRUSTACEA, FIFTY-ONE SPECIES  
OF MOLLUSCA, AND THREE SPECIES OF CRINOIDS, FROM THE CAR-  
BONIFEROUS FORMATION OF ILLINOIS AND ADJACENT STATES.

BY A. H. WORTHEN.

—♦♦♦—  
M A R C H, 1884.  
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SPRINGFIELD, ILL.  
ROKKER'S PRINTING HOUSE AND BINDERY.  
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## BULLETIN NO. 2.

In selecting a complete series of Carboniferous fossils for the State Museum of Natural History, out of the great mass of material brought together in the progress of the geological survey of the State, quite a number of species were found that could not be referred to any of the forms hitherto described, and a part of them are briefly noticed in the following pages.

The typical specimens that belong to the State collection will be placed on exhibition in the cases of the State Museum, where they will always be accessible for examination and comparison, and they will also be fully illustrated in a subsequent volume of the reports on the geological survey of the State, should the publication of such a volume be authorized by the next General Assembly.

### ORDER CRUSTACEA.

#### GENUS COLPOCARIS, Meek.

##### COLPOCARIS CHESTERENSIS. (sp. nov.)

Carapace valves large, elongate, ovate in outline, more than twice as long as high, the widest portion being about the middle; broadly and evenly curved from end to end on the dorsal margin; ventral margin nearly straight for about two-thirds its length, and then gradually curving upward to the evenly rounded anterior extremity.

The posterior extremity of our specimen is broken away so that its form cannot be clearly determined.

Length  $2\frac{5}{8}$  inches; greatest width, 1 inch.

Position and locality: From the lower division of the Chester limestone, Chester, Ill.

No. 2496 of the Illinois State collection.

Collector, A. H. Worthen.

#### GENUS SOLENOCARIS, Meek.

##### SOLENOCARIS ST. LUDOVICI. (sp. nov.)

Carapace valves narrow and elongated, the length being equal to about three times the height, probably slightly convex though flattened on the surface of the limestone; dorsal and ventral margins nearly straight and parallel; anterior end curving regularly upward to the dorsal margin; posterior end terminating in an obtuse point, the ventral margin being more strongly curved

at both extremities than the dorsal. The surface is covered with round pits which are most numerous and conspicuous near the margins, with traces of delicate longitudinal striae along the center of the valve when viewed under a good lens.

Length  $\frac{1}{6}$  inch; height,  $\frac{1}{6}$  inch.

Position and locality: St. Louis limestone, South St. Louis, Mo. No. 2497 of the Illinois State collection.

Collector, A. H. Worthen.

## ORDER MOLLUSCA.

### CLASS. CEPHALOPODA.

#### GENUS NAUTILUS, Breynius.

##### NAUTILUS MONTGOMERYENSIS. (sp. nov.)

Shell of medium size, sub-globose, volutions two or more, rapidly expanding; outer septum regularly rounded in front and on the sides, wider than long, with a wide and deep sinus in the middle of its dorsal border for the reception of the broad tongue-like projection of the next septum. The succeeding septa are much narrower, and more broadly curved on their dorsal sides, with a long and broad tongue-like projection in the middle that fills the sinus of the preceding septum. Position of the siphuncle unknown. The specimen is a cast in clay ironstone and shows no surface ornamentation.

Aperture reniform in shape, and  $3\frac{3}{4}$  inches in breadth by  $1\frac{5}{8}$  inches in height. Length of the shell from front to back,  $3\frac{1}{2}$  inches.

Position and locality: Upper Coal Measures, Montgomery county, Ill.

No. 2544 of the Illinois State collection.

Collector unknown.

## GASTEROPODA.

### GENUS PLEUROTOMARIA, Defrance.

##### PLEUROTOMARIA ILLINOIENSIS. (sp. nov.)

Shell discoidal, spire but slightly elevated; outer angle of the last volution sharp, volutions about five, aperture ovate. Suture line marked by a row of small nodes, of which about ten may be counted on the last volution. A revolving slightly impressed band may be seen with a good lens above the outer angle of the last volution, which probably joins the sinus in the lip; umbilicus shallow.

This shell is most nearly related to the flat variety of *P. sphaerulata*, described by Prof. Cox, under the name of *P. depressus*, but differs from that in its more flattened volutions, the impressed band on the lower volution, and its smaller and less conspicuous nodes.

Breadth of an average size specimen,  $\frac{9}{16}$  inch; height,  $\frac{3}{16}$  inch.  
Position and locality: From a black limestone over one of the lower coal seams in Mercer county, Ill.

No. 2530 of the Illinois State collection.  
Collector, A. H. Worthen.

PLEUROTOMARIA GIFFORDI. (p. nov.)

Shell small, conical, volutions about seven, spire sharply elevated, the last volution forming less than half the entire length, and ornamented below the spiral band with nine or ten revolving lines, that decrease in number on the succeeding volutions.

Spiral band concave and located a little above the middle of the lower volution, and defined by two strong revolving lines, the upper one of which is the strongest. There are also two or three revolving lines within the spiral band, and three or four on the upper angle of the volution, the last one of which is much stronger than the others.

Length  $\frac{6}{16}$  inch; diameter of the outer volution about  $\frac{4}{16}$  inch; spiral angle about  $43^\circ$ .

This shell is nearly related to *P. subconstricta*, Meek and Worthen, described and figured in Vol. II of these reports, page 351, Pl. 28, fig. 6, but differs from that in its surface ornamentation, and especially in its spiral angle.

Position and locality: Coal Measures, Peoria county, Ill.  
No. 2535 of the Illinois State collection.  
Collector, Mr. Gifford.

PLEUROTOMARIA ADAMSI. (sp. nov.)

Shell small, trochiform, conical; length a little more than the diameter of the lower volution. Volutions about six, the last one flat and smooth below the spiral band; umbilical region concave; spiral band prominent, deeply grooved, and occupying the angle on the periphery of the lower volution, becoming shallower and less prominent on those above. The elevations defining the upper and lower margins of the spiral band are marked by one or two revolving lines visible with an ordinary glass, which continue on the succeeding volutions where the spiral band becomes obsolete.

Length  $\frac{5}{16}$  inch; diameter of the last volution  $\frac{4}{16}$  inch; spiral angle about  $60^\circ$ .

Named in honor of Mr. W. H. Adams of Peoria county, from whom some of the specimens were obtained.

Position and locality: Coal Measures, Peoria county Ill.  
No. 2536 of the Illinois State collection.  
Collector, W. H. Adams.

PLEUROTOMARIA NAUVOOENSIS. (sp. nov.)

This form is represented in the State collection by a single cast in limestone from the upper part of the Keokuk limestone at Nauvoo.

Shell above the medium size, consisting of about four obliquely flattened volutions, the lower one forming about half the entire length. The periphery of the lower volution shows a flattened space about a quarter of an inch in width that was probably occupied by a spiral band. Form of aperture and surface markings unknown.

Length of the three lower volutions  $1\frac{3}{4}$  inches; greatest breadth  $1\frac{1}{4}$  inches.

No. 2493 of the Illinois State collection.

Collector, A. H. Worthen.

PLEUROTOMARIA COXANA. (sp. nov.)

Shell large, broadly umbilicated, spire moderately extended, its length being equal to about one-third the full length of the shell; volutions about four, strongly and evenly convex above, and increasing gradually in size, the last one abruptly rounded below into the umbilicus; aperture apparently subovate. The specimen is a cast in limestone, and the surface was probably nearly smooth, as the fragments of the adhering test show no external markings.

Length  $2\frac{1}{4}$  inches; breadth  $1\frac{3}{4}$  inches; diameter of the last volution  $1\frac{6}{8}$  inches.

Named in honor of Mr. L. A. Cox, of Keokuk, from whom the specimen was received.

Position and locality: Keokuk limestone, Keokuk, Iowa.

No. 2547 of the Illinois State collection.

Collector, Mr. L. A. Cox.

GENUS PORCELLIA, Leveille.

PORCELLIA PEORIENSIS. (sp. nov.)

Shell small, volutions about five, closely embracing and very gradually enlarging, the last one marked by a narrow dorsal band, defined by a sharp elevated ridge on either side. Outer volution ornamented also with a row of about nine small nodes on either side, which are situated about one-third the distance from the inner margin to the dorsal band. Umbilical depression broad and shallow.

The surface of the shell in some of our specimens is thickly pitted with small round depressions that are plainly visible under a good lens, but they may however be due to some secondary cause.

Greatest diameter of the shell  $\frac{1}{2}$  inch; transverse diameter of the outer volution  $\frac{1}{4}$  inch.

Position and locality: This rare and beautiful little shell was found in the lower Coal Measures of Peoria county, Ill.

No. 2531 of the Illinois State collection.

Collector, Mr. Gifford.

## GENUS LOXONEMA, Phillips.

## LOXONEMA PEORIENSIS. (sp. nov.)

Shell below the medium size, elongate conical, spire very gradually tapering to a minute point. Volutions about sixteen, convex, increasing very gradually in size, the lower ones a little flattened above the middle. Suture moderately deep, surface smooth. Aperture nearly round.

Length  $\frac{3}{4}$  inch; diameter of the lower volution  $\frac{3}{16}$  inch. Spiral angle  $16^{\circ}$ .

This species is nearly related to *L. cerithiformis* of Meek and Worthen, described and figured in Vol. II of these reports, page 379. Pl. 31. fig. 13, a, b, c, but may be readily distinguished from that, by its more slender form and more numerous volutions.

Position and locality: Coal Measures, Peoria county, Ill.

No. 2532 of the Illinois State collection.  
Collector, Mr. Gifford.

## LOXONEMA QUADRI-CARINATUS. (sp. nov.)

Shell long, cylindrical, gradually tapering; volutions eight or more, convex, the last one sloping abruptly to the umbilical region below, and more gradually to the suture above. Volutions ornamented with three strong revolving carinae on the lower portion of the volutions, and a less defined one on the upper sloping side below the suture. Transverse lines of growth are visible under a lens on the abruptly sloping under side of the last volution. Aperture ovate.

Length of a specimen preserving six volutions  $\frac{13}{16}$  inch; diameter of the lower volution  $\frac{6}{16}$  inch. Spiral angle  $25^{\circ}$ .

Position and locality: Coal Measures, Peoria county, Ill.  
No. 2534 of the Illinois State collection.  
Collector, Mr. Gifford.

## GENUS ORTHONEMA, Meek and Worthen.

## ORTHONEMA CARBONARIA. (sp. nov.)

Shell very elongate, gradually tapering from the base to the apex, with nine or more flattened volutions that are defined above and below by a narrow suture, and a strong revolving carina. Under side of the last volution obliquely flattened; umbilicus closed. Form of aperture not clearly defined, but apparently subovate. Lines of growth are clearly visible on the flat portions of the volutions. Length of a specimen showing seven volutions,  $\frac{19}{16}$  inch; diameter of lower volution  $\frac{4}{16}$  inch. Spiral angle about  $20^{\circ}$ .

This shell is known only from an imperfect example, and is nearly related to *O. Salteri*, of Meek and Worthen, Vol. II of

these reports, page 381. Pl. 31. fig. 14. a, b, c, but differs from that, in its surface ornamentation and its spiral angle.

Position and locality: Coal Measures, Peoria county, Ill.

No. 2533 of the Illinois State collection.

Collector, Mr. Gifford.

### GENUS TRACHYDOMIA, Meek and Worthen.

#### TRACHYDOMIA NODULOSA. (sp. nov.)

Shell of medium size, obliquely ovate or sub-rhomboidal in outline, volutions four, the last one comparatively large and comprising more than two-thirds the entire length, rounded below and slightly flattened above to the nearly perpendicular lower border of the rather deeply impressed suture. Aperture nearly sub-ovate with a well defined notch at its lower extremity; lip sharp, columella flattened and smooth; surface thickly covered with prominent rounded nodes that are largest on the upper edge of the volution, and increase in number as they decrease in size towards the umbilical region. The nodes become obsolete on the lower extremity of the last volution, leaving a limited space around the lip that is ornamented only with a few rather coarse lines of growth.

Length of an average size specimen  $1\frac{9}{16}$  inch; breadth  $1\frac{7}{16}$  inch.

This shell is about midway in form and size between *T. Wheeleri*, and *T. Hollidayi*, but differs from both in the form of its aperture, and from the latter also in its more numerous and differently formed nodes.

Position and locality: Coal Measures, Peoria county, Ill.

No. 2538 of the Illinois State collection.

Collectors, W. H. Adams and Mr. Gifford.

### GENUS BELLEROPHON, Montfort.

#### BELLEROPHON GIGANTEUS. (sp. nov.)

Shell very large, sub-globose; volutions expanding rapidly, rounded over the dorsum and sides; umbilical region deeply excavated. Aperture reniform or sublunate, mesial band not shown on the east. Fragments of the shell adhering show that it was comparatively thick.

Greatest breadth of the aperture about 4 inches; height of the same  $2\frac{1}{2}$  inches; length from front to back  $3\frac{13}{16}$  inches.

This shell is only known from a cast in limestone, but it may be readily distinguished by its size and general form from all known American species.

Position and locality: Lower Coal Measures, Monroe county, Ill.

No. 2543 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS NATICOPSIS, McCoy.

## NATICOPSIS MADISONENSIS. (sp. nov.)

Shell large, sub-rhomboidal or sub-rectangular in outline; volutions about three, the last one comprising more than two-thirds the entire length of the shell, all rounded, and the last quite gibbous; umbilicus deep, aperture apparently subcircular. The specimen is a cast in limestone, and shows no external markings except some faint lines of growth.

Length  $2\frac{1}{6}$  inches; breadth of the last volution  $1\frac{5}{6}$  inches.

In form and size this shell approaches most nearly to *N. giganteus* of the Coal Measures, but it differs from that in having one less volution, and it also lacks the flattened depression on the outer volution which characterizes that species.

Position and locality: St. Louis limestone, Madison county, Ill.

No. 2546 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS POLYPHEMOPSIS, Portlock.

## POLYPHEMOPSIS? KEOKUK. (sp. nov.)

A cast of this shell in limestone from the lower portion of the Keokuk limestone in the vicinity of Keokuk presents the following characters:

Shell about the medium size, consisting of about five moderately convex volutions, the last one constituting more than one-half the entire length. The volutions taper gradually, and present no indications of external ornamentation.

Exact form of aperture unknown. Length of the four volutions preserved,  $2\frac{5}{8}$  inches; length of last volution,  $1\frac{1}{2}$  inches; breadth of the same where it seems to be somewhat flattened by pressure,  $\frac{3}{4}$  inch.

No. 2194 of the Illinois State collection.

Collector, Mr. L. A. Cox of Keokuk.

## LAMELLIBRANCHIATA.

## GENUS SCHIZODUS, King.

## SCHIZODUS MAGNUS. (sp. nov.)

Shell large, ovate sub-quadrangular, convex, the greatest convexity being about half-way from the beaks to the ventral margin; anterior extremity comparatively long and broadly rounded, posterior side about once and a half the length of the anterior, obliquely flattened behind the beaks with a well defined umbonal

ridge extending diagonally from the beak to the posterior extremity of the ventral margin. Dorsal margin straight from the beaks to the obliquely truncated posterior margin.

Beaks long, strongly recurved, and projecting about  $\frac{3}{8}$  of an inch beyond the dorsal margin.

Length  $3\frac{7}{16}$  inches; height  $2\frac{6}{16}$  inches; convexity of the valve about  $\frac{1}{2}$  inch.

This is the largest species of *Schizodus* hitherto found in this State, and is from one of the upper divisions of the Chester limestone, about two miles below the mouth of Marys river, Randolph county, Ill.

No. 248 of the Illinois State collection.  
Collector, A. H. Worthen.

**SCHIZODUS VARSOVIENSIS. (sp. nov.)**

Shell of medium size, transversely ovate, moderately convex in the anterior and umbonal regions, cuneate posteriorly; anterior side very short and regularly rounded; basal margin forming a very gentle curve that is most prominent near the anterior margin; posterior extremity contracted and narrowly rounded; dorsal margin nearly straight, beaks depressed, incurved and located about one-third the length of the shell from the anterior margin. Surface markings unknown.

Length of an internal cast in limestone  $1\frac{1}{8}$  inches; height of same  $\frac{7}{8}$  inch, convexity about  $\frac{5}{8}$  inch.

This species may be readily distinguished from *S. Chesterensis*, which it approaches in size and form, by its relative proportions and more depressed beaks.

Position and locality: The upper part of the Keokuk limestone, Warsaw Ill.

No. 250 of the Illinois State collection.  
Collector, A. H. Worthen.

**SCHIZODUS NAUVOENSIS. (sp. nov.)**

This shell is only known from a cast of a single valve in limestone, but it differs so decidedly from all others of this genus, that it may be readily characterized as follows:

Shell above the medium size, obliquely sub-ovate, rather strongly convex from the beak obliquely downward for about half the length of the valve, and thence gradually depressed to the ventral margin; anterior extremity regularly rounded from the dorsal to the ventral margin, posterior side oblique, the marginal line curving in below the beak; ventral margin not entire, beak pointed, elevated and incurved, and situated near the anterior margin, surface markings unknown. A well-defined ovate muscular scar is conspicuous just below the beak, and near the anterior border of the shell.

Length from the beak to the ventral margin measuring obliquely, 2 inches; greatest breadth  $1\frac{3}{8}$  inches.

Position and locality: Keokuk limestone, Nauvoo Ill.

No. 2499 of the Illinois State collection.

Collector, A. H. Worthen.

SCHIZODUS DEPRESSUS. (sp. nov.)

Shell below the medium size, transversely ovate, slightly convex, beak depressed, posterior extremity cuneate, anterior extremity regularly rounded into the semi-ovate curve of the basal region. Posterior side a little longer than the anterior, and rather sharply rounded at the extremity; dorsal margin rapidly sloping towards the anterior extremity; surface smooth.

Length of an average size specimen  $\frac{9}{16}$  inch; height from beak to basal margin  $\frac{7}{16}$  inch; convexity of the valves about  $\frac{1}{8}$  inch.

This species may be readily distinguished from all previously described species by its generally depressed form.

Position and locality: Oolitic beds of the St. Louis group, Monroe county, Ill.

No. 2520 of the Illinois State collection.

Collector, A. H. Worthen.

SCHIZODUS? CIRCULUS. (sp. nov.)

In the collection from the oolitic beds of Monroe county, there are three or four detached valves of a small shell, that are doubtfully referred to the genus *Schizodus*, and which may be characterized as follows:

Shell small, nearly circular in outline, slightly inequilateral, valves slightly convex, beaks depressed, and extending slightly beyond the cardinal border. A very slight umbonal ridge is apparent on some of the specimens that becomes obsolete before reaching the basal margin. Surface smooth. Height from beak to base  $\frac{7}{16}$  inch; length  $\frac{1}{2}$  inch.

This shell resembles the form figured and described by Prof. McCoy in his "Synopsis of the Carb. Fossils of Ireland," Pl. XI, fig. 13, but is much more nearly circular than his *Dolabra orbicularis*.

Position and locality: Oolitic beds of the St. Louis group, Monroe county, Ill.

No. 2521 of the Illinois State collection.

Collector, A. H. Worthen.

GENUS ALLORISMA, King.

ALLORISMA ILLINOIENSIS. (sp. nov.)

Shell large, elongate-ovate, length a little more than twice the height; valves moderately convex, extremities broadly rounded; dorsal margin straight and nearly parallel with the base; anterior

extremity short and rather more narrowly rounded than the posterior, and descending obliquely from the beaks. Beaks compressed, extending beyond the cardinal border, and located about one-fourth the entire length of the shell behind the anterior extremity. Surface of the cast ornamented with rather strong parallel lines of growth.

Length  $3\frac{9}{16}$  inches; height from the beak to the basal margin  $1\frac{1}{2}$  inches; convexity of the valves about  $\frac{7}{16}$  inch.

This species resembles *A. subcuneata* in size and form, but lacks the concentric undulations of that species.

Position and locality: Keokuk limestone, Warsaw, Ill.

No. 2540 of the Illinois State collection.

Collector, A. H. Worthen.

ALLORISMA ELONGATA. (sp. nov.)

Shell large, very elongate, dorsal and ventral margins nearly straight and parallel; length three times as great as the height; greatest convexity in the umbonal region; cuneate and perhaps a little gaping behind, with a rather narrowly rounded outline. Beaks recurved, approximate, and located near the anterior extremity. Anterior margin evenly rounded. The surface of the cast shows numerous concentric undulations that are much smaller and more numerous than in *A. subcuneata*, its nearest representative form.

Length  $3\frac{5}{8}$  inches; height  $1\frac{5}{8}$  inches; breadth near the umbo  $1\frac{1}{8}$  inches.

Position and locality: Keokuk limestone, Warsaw Ill.

No. 2542 of the Illinois State collection.

Collector, A. H. Worthen.

GENUS SOLENOMYA, Lamark.

SOLENOMYA VARSOVIENSIS. (sp. nov.)

Shell rather large, elongate-oval or sub-elliptical in outline, moderately convex, and apparently closed at the extremities. The greatest convexity of the valves is in the umbonal region, and thence obliquely to the ventral margin, and in front of this elevated region a slight depression may be seen which extends nearly to the anterior extremity. Beaks depressed and recurved towards the posterior margin, and located a little less than one-third the entire length of the valve behind the anterior extremity.

Dorsal and ventral margins nearly straight and sub-parallel, anterior extremity rather narrow, and the posterior broadly rounded.

Surface of the cast marked by a few obscure wrinkles near the umbo, and lines of growth towards the ventral margin.

Length about 3 inches; height from the beak to the ventral margin  $1\frac{1}{4}$  inches; convexity of the valves about  $\frac{7}{16}$  inch.

Position and locality: Keokuk limestone, Warsaw, Ill.

No. 2539 of the Illinois State collection.

Collector, A. H. Worthen.

## SOLENOMYA MONROENSIS. (sp. nov.)

Shell below the medium size, oblong, the length being a little more than twice the height from the beak to the ventral margin; valves moderately convex, the greatest convexity being obliquely along the umbonal slopes from the beaks to the ventral margin; cardinal margin straight and about three-fifths the entire length of the valve; basal margin slightly sinuous, from a shallow depression that extends obliquely from the beaks to the opposite margins, extremities rounded; beaks depressed, oblique, and located about one-sixth the entire length of the valves behind the anterior extremity.

Surface smooth or showing only a few obscure lines of growth. Length of the largest specimen obtained  $\frac{13}{16}$  inch; height from beak to base  $\frac{6}{16}$  inch.

Position and locality: Obtained from the oolitic beds of the St. Louis limestone on Fountain creek, Monroe county, Ill.

No. 2515 of the Illinois State collection.

Collector, A. H. Worthen.

## SOLENOMYA? IOWAENSIS. (sp. nov.)

Shell small, narrow, oblong, valves apparently closed at each extremity.

Dorsal and ventral margins nearly parallel, beaks depressed and situated close to the anterior extremity. Surface markings unknown.

Length of the largest specimen seen  $\frac{7}{16}$  inch; height  $\frac{1}{4}$  inch; thickness  $\frac{1}{8}$  inch. This little shell is only known from a few casts obtained from the shaly layers of the St. Louis limestone near Pella, Iowa, where it was associated with *Allorisma Marionensis*, *Rhynchonella Ottumwa*, *Spirifer Littoni* and *Zaphrentis* sp?

No. 2517 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS AVICULOPINNA, Meek.

## AVICULOPINNA ILLINOENSE. (sp. nov.)

Shell rather larger than the typical species, valves moderately and about equally convex, cardinal and ventral margins curved, and converging gradually from the base to the apex. Surface ornamented with numerous thread-like lines or lamellæ that curve gracefully round to the dorsal margin, and are separated by rather broad spaces on the dorsal portion of the valve. The apex is broken away so that its form cannot be determined.

Length  $1\frac{9}{16}$  inches; greatest width  $\frac{7}{8}$  inch; greatest thickness  $\frac{1}{2}$  inch. This species differs from the *A. Americana*, in the curvature of its margins and the greater convexity of the valves.

Position and locality: Coal Measures, Peoria county, Ill.

No. 2529 of the Illinois State collection.

Collector, Mr. Gifford.

## GENUS SANGUINOLITES, McCoy.

## SANGUINOLITES? MULTISTRIATUS. (sp. nov.)

The specimen from which the following description is drawn, is a cast from the shaly sandstone of the Keokuk group, and may be characterized as follows.

Shell below the medium size, oblong, valves moderately convex; beaks depressed, and situated about one-third the entire length of the shell behind the anterior extremity.

Dorsal line straight, basal border slightly rounded, extremities obtusely pointed and apparently gaping, surface marked by numerous fine concentric striae that are most conspicuous on the posterior portion of the valves. The specimen is somewhat distorted by pressure, so that its exact proportions cannot be determined.

Length 1 inch; height  $\frac{3}{8}$  inch.

Position and locality: Keokuk shales near Crawfordsville, Indiana.

No. 2528 of the Illinois State collection.  
Collector, Frank H. Bradley.

## SANGUINOLITES? BURLINGTONENSIS. (sp. nov.)

Shell of medium size, longitudinally elongate-ovate, more than twice as long as high, moderately and evenly convex anteriorly, and regularly depressed towards the posterior extremity. Cardinal margin slightly depressed in the middle and elevated behind, giving a greater breadth to the posterior than the anterior region.

Beaks not prominent, and situated close to the anterior extremity. The specimen is a cast, and shows no surface markings.

Length  $1\frac{7}{8}$  inches; greatest height  $\frac{11}{16}$  inch.

Position and locality: Burlington limestone, Calhoun county, Ill.

No. 2541 of the Illinois State collection.  
Collector, A. H. Worthen.

## GENUS BAKEVELLIA, King.

## BAKEVELLIA ILLINOIENSIS. (sp. nov.)

Shell about medium size, elongate subrhomboidal, left valve moderately convex from a ridge which extends from the beak about two-thirds the distance to the cardinal border where it becomes obsolete.

This ridge slopes abruptly to the dorsal margin, and more gradually to the anterior portion of the shell. Posterior wing equal to about two-fifths of the entire length of the shell. Umbonal region squarely truncated at the apex, upper portion of the an-

terior margin nearly straight to the point where it joins the ventral portion of the valve, or about one-fourth its entire length. Surface ornamented with numerous concentric lines of growth, which are closely arranged on the umbo, but become more widely spaced on the lower margins of the shell. Right valve unknown.

Length  $1\frac{1}{8}$  inches; greatest breadth about  $\frac{1}{2}$  inch; convexity of left valve  $\frac{1}{4}$  inch.

Position and locality: Upper Coal Measures, LaSalle, Ill.

No. 225 of the Illinois State collection.

Collector, A. H. Worthen.

#### GENUS MYALINA, DeKoninck.

##### MYALINA MONROENSIS. (sp. nov.)

Shell small, nearly equivalve, moderately convex on the umbonal slopes from the beaks two-thirds the distance to the posterior extremity, becoming gradually depressed below. Posterior and postero-lateral regions cuneate; cardinal margin nearly straight, and about half as long as the valves, gradually rounding below to the basal extremity. Beaks small, slightly oblique, and not projecting beyond the cardinal margin. Angle of the anterior and posterior margin about  $50^{\circ}$ . Surface smooth, or with very obscure traces of lines of growth. Length of a medium size specimen  $\frac{1}{2}$  inch; greatest width of the valve  $\frac{7}{16}$  inch, convexity of valve about  $\frac{1}{8}$  inch.

Position and locality: Oolitic beds of the St. Louis group, Monroe county, Ill.

No. 2522 of the Illinois State collection.

Collector, A. H. Worthen.

#### GENUS NUCULA, Lamark.

##### NUCULA ILLINOIENSIS. (sp. nov.)

Shell small, transversely ovate, depressed convex, the greatest convexity about the middle of the valves; slightly excavated in front of the beaks; anterior end regularly rounded to the ventral margin, dorsal outline declining moderately from the beaks to the posterior extremity; ventral margin slightly curved; beaks depressed and situated about one-third the distance from the anterior to the posterior extremity.

Length  $\frac{6}{16}$  inch; height  $\frac{4}{16}$  inch. Surface nearly smooth, but in some of the specimens, faint lines of growth may be seen with a good lens around the borders of the shell.

Position and locality: Oolitic bed of the St. Louis limestone, Monroe county, Ill.

No. 2519 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS MODIOLA, Lamark.

## MODIOLA ILLINOIENSIS. (sp. nov.)

Shell below medium size, length from the anterior to the posterior extremities a little more than twice the width of the valves, narrowing rather rapidly behind the posterior extremity of the hinge line; valves strongly convex in the umbonal region, and obliquely across the valve to the ventral margin, compressed behind; beaks depressed, hinge line equal to three-fifths the entire length. A shallow depression extends from the beak obliquely to the ventral margin in front of the umbonal ridge, posterior margin narrowly rounded, anterior extremity obtusely pointed, ventral margin slightly sinuate in the middle, hinge line straight, surface nearly smooth but showing a few obscure lines of growth.

Length of an average size specimen  $1\frac{5}{8}$  inch; breadth at the posterior extremity of the hinge line  $\frac{7}{16}$  inch; convexity of the valve about  $\frac{3}{16}$  inch.

Position and locality: From the oolitic beds of the St. Louis group, Monroe county, Ill.

No. 2518 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS CARDIOMORPHA, DeKoninck.

## CARDIOMORPHA ? PELLAENSIS. (sp. nov.)

Shell longitudinally sub-ovate, length less than once and a half the height; dorsal and ventral borders sub-parallel, dorsal margin nearly straight, ventral margin moderately curved; valves convex, the greatest convexity being about one-third the distance from the beaks to the ventral margin; beaks depressed, and placed close to the anterior extremity which is nearly straight above, and curving below into the ventral margin; posterior extremity cuneate.

The specimen is a cast in a calcareous shale, and shows no surface ornamentation.

Length  $1\frac{1}{8}$  inch; height  $\frac{7}{16}$  inch; thickness  $\frac{5}{16}$  inch.

Position and locality: Shaly limestone of the St. Louis group, Pella, Iowa.

No. 2516 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS PLEUROPHORUS, King.

## PLEUROPHORUS CHESTERENSIS. (sp. nov.)

Shell of medium size, nearly cylindrical when the valves are closed, almost three times as long as high, most strongly convex

on the anterior half of the shell; cardinal margin straight and about equaling three-fourths the entire length of the valves; basal margin slightly sinuous near the middle; anterior extremity broadly rounded and wider than the posterior; beaks depressed and located very near the anterior extremity. An ill-defined radiating ridge extends from behind the beaks obliquely to the posterior margin, between which and the cardinal margin some indistinct traces of longitudinal costæ may be seen.

The specimen is a cast in limestone of both valves slightly displaced. Minute surface markings unknown.

Length  $1\frac{9}{16}$  inches, height from beak to base  $\frac{5}{8}$  inch.

Position and locality: Chester limestone, Chester, Ill.

No. 2501 of the Illinois State collection.

Collector, A. H. Worthen.

*PLEUROPHORUS MINIMA.* (sp. nov.)

Shell small, about twice as long as high, moderately convex. Outline elongate ovate. Anterior margin slightly produced forming an obtuse point, posterior margin obliquely truncated; dorsal and ventral margins nearly straight and sub-parallel, the latter rounding up to the obtuse anterior extremity. Beaks depressed, and placed about one-fourth the length of the valve behind the anterior extremity.

Posterior umbonal slopes sub-angular from the beaks obliquely backward and downward to the posterior extremity, with a decided depression between their slopes and the cardinal margin. Surface marked by linear lines of growth, crossed by radiating costæ, which are most strongly defined on the depression of the cardinal area, and on the posterior portion of the shell.

Length  $\frac{5}{16}$  inch; height  $\frac{1}{8}$  inch; convexity of the valves about  $\frac{1}{16}$  inch.

Position and locality: Oolitic beds of the St. Louis limestone, Monroe county, Ill.

No. 2524 of the Illinois State collection.

Collector, A. H. Worthen.

*PLEUROPHORUS MONROENSIS.* (sp. nov.)

Shell elongate-oblong, moderately convex; umbonal ridges forming the most convex part of the valves; length about twice as much as the height: a well-defined ridge commencing at the beak extends diagonally to the posterior extremity; anterior ventral region depressed; cardinal margin straight, and rather more than half the entire length of the shell; basal margin nearly straight in the middle, but rounding up in front to the anterior extremity; beaks depressed to the hinge line, and placed about one-fourth the length of the shell behind the anterior extremity, surface smooth.

Length  $\frac{1}{2}$  inch; height  $\frac{1}{4}$  inch; convexity about  $\frac{1}{8}$  inch.

Position and locality: Oolitic beds of the St. Louis group, Monroe county, Ill.

No. 2523 of the Illinois State collection.

Collector, A. H. Worthen.

#### GENUS EDMONDIA, DeKoninck.

##### EDMONDIA VARSOVIENSIS. (sp. nov.)

Shell above the medium size, compressed and evenly rounded at the extremities; length about one-third greater than the height; basal margin broadly semi-ovate in outline, dorsal margin sloping abruptly from the beaks in front, and nearly straight behind for about two-thirds the entire length of the shell, and thence rounding into the posterior margin; beaks depressed and located near the anterior extremity.

The surface of the cast shows traces of delicate closely arranged concentric striae, and a few more distinct lines of growth.

Length of the typical specimen  $2\frac{1}{8}$  inches; height  $1\frac{3}{8}$  inches. This shell is only known from limestone casts.

Position and locality: From the upper part of the Keokuk limestone, Warsaw, Ill.

No. 2502 of the Illinois State collection.

Collector, A. H. Worthen.

##### EDMONDIA ILLINOIENSIS. (sp. nov.)

Shell of medium size, transversely sub-oval, convex, broadly rounded at the extremities; dorsal margin straight behind the beak for about two-thirds its length, and thence rounding into the posterior border; basal margin slightly sub-ovate; beak depressed and located about one-third the entire length of the shell from the anterior extremity. Surface of the cast marked by distinct parallel lines of growth.

Length  $1\frac{7}{8}$  inches; height  $1\frac{1}{16}$  inches; convexity of the valves about  $\frac{5}{16}$  inch.

This is a smaller and more convex shell than the preceding species, and shows none of the fine concentric striae that appear on the *E. Varsoriensis*.

Position and locality: Same as the preceding species.

No. 2503 of the Illinois State collection.

Collector, A. H. Worthen.

#### GENUS AVICULOPECTEN, McCoy.

##### AVICULOPECTEN ORESTES. (sp. nov.)

Shell below the medium size, equilateral, broadly ovate when divested of the ears; hinge line about equal to the greatest breadth of the shell; ears of moderate size and smooth or showing only

faint lines of growth; lateral sides diverging for a short distance below the ears, and then broadly rounding into the basal border.

Surface ornamented with about 18 to 20 even, stout, rounded ribs or costæ, that are about twice as wide as the intervening spaces.

Length from beak to base  $\frac{15}{16}$  inch; breadth 1 inch; length of hinge line about  $\frac{7}{8}$  inch. This shell may be readily distinguished from others occurring in the same horizon by its broad rounded costæ.

Named in honor of my friend Prof. Orestes St. John, of Topeka, Kansas.

Position and locality: Keokuk limestone, Warsaw, Ill.

No. 2504 of the Illinois State collection.

Collector, A. H. Worthen.

AVICULOPECTEN NIOTENSE. (sp. nov.)

Shell large, orbicular, nearly or quite equilateral, length and breadth about equal, hinge line shorter than the greatest width of the shell. Left valve moderately convex, basal margin broadly and evenly rounded, anterior ear short, triangular, and separated from the lateral margin by a well-defined sinus. Posterior ear more than twice as long as the anterior, and pointed at the extremity. Surface of the valve ornamented with numerous fine radiating costæ, of which about fourteen may be counted near the basal margin in the space of half an inch. These costæ appear to become obsolete on the ears and on the lateral borders of the shell.

Length  $2\frac{3}{4}$  inches; breadth about the same; length of hinge line about 2 inches.

This shell may be readily distinguished from the *A. Varsoviensis*, described and figured in Vol. VII of these reports, by the much finer radiating costæ with which it is ornamented.

Position and locality: Keokuk limestone, Niota, Hancock county, Ill.

No. 2505 of the Illinois State collection.

Collector, A. H. Worthen.

AVICULOPECTEN ELSAHENSIS. (sp. nov.)

Shell of medium size, left valve moderately convex, and exclusive of the ears presenting a slightly oblique sub-trigonal outline; hinge line equaling about two-thirds the greatest width of the valve; basal outline forming a somewhat oblique semi-circular curve; posterior margin straight from the base of the ear to the basal curve where the valve attains its greatest width. Anterior margin regularly rounded; anterior ear small and obtusely angular; posterior ear large, triangular, and sharply pointed at the extremity. Surface of the ears apparently without ornamentation. Surface of the shell ornamented with numerous radiating costæ that in-

crease by implantation, and are somewhat variable in size, being usually about equal to the intervening spaces.

Length  $1\frac{1}{6}$  inches; breadth  $1\frac{1}{6}$  inches; length of hinge line  $1\frac{1}{8}$  inches.

Position and locality: Kinderhook group? half a mile above Elsah, Jersey county, Ill.

No. 2506 of the Illinois State collection.

Collector, A. H. Worthen.

**AVICULOPECTEN CHESTERENSIS. (sp. nov.)**

Shell above the medium size, nearly equilateral, broadly ovate or semi-circular in outline, a little wider than long; left valve moderately convex, beak depressed and extending slightly beyond the cardinal border. Anterior ear broken away, posterior ear small and ornamented with fine lines of growth. Surface of the valve ornamented with 36 to 40 radiating unequal-sized costæ, the alternate ones nearly twice as wide as the others, and all traversed for more than half their length by smaller costæ which become obsolete before reaching the cardinal border. Traces of numerous transverse striæ are also visible where the surface of the shell is well preserved.

Length  $2\frac{1}{8}$  inches; breadth  $2\frac{1}{4}$  inches.

This shell is closely allied to *A. Providensis*, Cox, sp. from the Coal Measures of Kentucky, but differs from that in its smaller and more numerous costæ and transverse striæ.

Position and locality: Lower division of the Chester limestone, Chester Ill.

No. 2507 of the Illinois State collection.

Collector, Mrs. J. C. Salter.

**AVICULOPECTEN SPINULIFERUS. (sp. nov.)**

Shell of medium size, inequilateral, obliquely ovate; left valve moderately convex, and ornamented with about fifty angular spiniferous costæ, each alternate one being about twice as large as the others, the small ones coalescing with the large ones before reaching the cardinal border. Beak moderately elevated, and located about one-third nearer the anterior than the posterior termination of the hinge line. Anterior ear sharply triangular, about half as large as the posterior, and ornamented with three or more spiniferous costæ similar to those on the body of the shell. Posterior ear large and not clearly defined from the lateral border, the spiniferous costæ extending without interruption to the cardinal border. Anterior lateral border neatly rounded from the sinus below the ear to the ventral border.

Length measuring obliquely from the beak to the basal margin  $1\frac{1}{6}$  inches; breadth  $1\frac{3}{4}$  inches; length of hinge line  $1\frac{5}{8}$  inches, posterior ear  $\frac{1}{8}$  inch; anterior ear  $\frac{1}{6}$  inch. Right valve unknown.

Position and locality: Keokuk shale, Crawfordsville, Indiana.

No. 2508 of the Illinois State collection.

Collector, Frank H. Bradley.

## AVICULOPECTEN MONROENSIS. (sp. nov.)

Shell below the medium size, left valve moderately convex, subovate or nearly circular below the ears, the lateral borders gradually rounding into the broadly rounded basal margin. Ears nearly equal in size and ornamented with five or six radiating costæ similar to, and continuous with those on the body of the shell, and also with delicate concentric lines that are plainly visible under an ordinary lens. Surface of the valve ornamented with 60 to 70 irregular sized rounded costæ that are usually a little wider than the intervening spaces, and fine transverse striae similar to those on the ears, which are only visible under a lens. A right valve belonging apparently to this species is nearly flat, radiating costæ very fine, anterior ear longer than the other and defined by a deep narrow sulcus, and both ornamented with costæ and concentric striae that are a little less conspicuous than those on the opposite valve.

Length of left valve  $\frac{11}{16}$  inch; breadth about the same; length of hinge line  $\frac{9}{16}$  inch.

Position and locality: Oolitic beds of the St. Louis group, Monroe county, Ill.

No. 2509 of the Illinois State collection.  
Collector, A. H. Worthen.

## AVICULOPECTEN TALBOTI. (sp. nov.)

Associated with the *A. Monroensis*, there is a smaller form that seems to be clearly distinct, and may be characterized as follows:

Shell small, broadly ovate in outline, left valve moderately convex, ears short and not well defined from the lateral borders. Surface apparently smooth, but under a good lens minute radiating and concentric lines, may be seen, which are most conspicuous on the ears and lateral borders of the shell.

Length of the largest individual seen  $\frac{1}{2}$  inch; breadth about the same; length of hinge line about  $\frac{1}{4}$  of an inch. This form differs from the *A. Monroensis* in its smaller size and nearly smooth surface. Named in honor of my friend Henry Talbot, Esq., of Waterloo.

Position and locality: Same as the last.  
No. 2510 of the Illinois State collection.  
Collector, A. H. Worthen.

## AVICULOPECTEN COLLETTI. (sp. nov.)

Shell below the medium size, inequilateral, ovate. Left valve slightly convex, ears well defined and unequal in size. Anterior ear small, triangular, posterior ear rather larger than the anterior, ornamented with four or five longitudinal costæ and fine transverse lines of growth, with a well defined notch at its junction with the lateral border. Lateral borders straight nearly to the

middle of the valve and thence rounding into the ventral border.

Surface of the valve ornamented with 35 to 40 slightly convex radiating costæ which increase in size towards the free borders of the shell.

Right valve nearly flat, ears rather more prominent than on the opposite valve, and radiating costæ less distinct. Length from the beak to the ventral margin  $\frac{5}{8}$  inch; greatest breadth  $1\frac{1}{6}$  inch; length of hinge line  $\frac{3}{4}$  inch.

Named in honor of Prof. John Collett, the able State Geologist of Indiana.

Position and locality: From the shaly beds of the Keokuk group. Crawfordsville, Indiana.

No. 2512 of the Illinois State collection.

Collector, Frank H. Bradley.

*AVICULOPECTEN EDWARDSSI.* (sp. nov.)

Shell of medium size, obliquely ovate, right valve very convex, breadth a little more than the length; anterior ear rather large, triangular, posterior ear not preserved; posterior border oblique, and extending in a nearly straight line from the beak to the basal margin; anterior border moderately rounded from the ear to the basal margin.

Surface of the valve ornamented with ten or twelve rather sharp prominent costæ, with two or three indistinct ones in the intervening spaces on the lower portion of the shell.

Length from beak to base  $1\frac{3}{8}$  inches; greatest breadth  $1\frac{5}{6}$  inches; length of anterior ear  $\frac{6}{7}$  inch.

Position and locality: From the upper division of the Keokuk limestone, Warsaw, Ill.

No. 2511 of the Illinois State collection.

Collector, A. H. Worthen.

GENUS *LIMA*, Bruguiere.

*LIMA?* *MENARDI.* (sp. nov.)

Shell small, thin, obliquely ovate, very inequilateral; ears small, nearly equal in size, triangular; hinge line straight, and about half as long as the greatest width of the shell. Right valve nearly flat, anterior side projecting forward, with a nearly straight margin to the regular curve of the basal margin; posterior side shorter than the anterior, and rounding up from the basal margin nearly to the ear, where it makes a slight backward curve, forming a slight sinus just below the ear.

Surface marked by numerous transverse striae, that extend from the hinge line quite around the borders of the shell, covering apparently its entire surface. Left valve unknown.

Length from the hinge line to the basal margin,  $\frac{1}{2}$  inch; greatest breadth about the same; length of the hinge line  $\frac{1}{4}$  inch.

The only specimen of this pretty shell in the State collection, was obtained from the bituminous shale forming the roof of the Greenview coal in Menard county.

No. 2513 of the Illinois State collection.  
Collector, A. H. Worthen.

## BRACHIOPODA.

### GENUS DISCINA, Lamark.

#### DISCINA VARSOVIENSIS. (sp. nov.)

Shell of medium size, ovate in outline, anterior and posterior margins nearly equal in width. The larger or free valve is crushed so that its general form cannot be clearly determined; its surface however, is ornamented around the borders with ten to twelve or more rather strong and sharp concentric ridges, which become less conspicuous or obsolete towards the apex.

The lower valve is nearly flat and marked around the border by fine concentric ridges rather less conspicuous than those on the other valve, with a long narrow slit or foramen extending from about the center of the valve more than half way to the posterior extremity, and surrounded by an elevated margin.

Length of an average size lower valve  $\frac{3}{4}$  inch; greatest breadth of the same  $\frac{1}{6}$  inch.

Position and locality: Keokuk limestone, Warsaw, Ill.

No. 2545 of the Illinois State collection.

Collector, A. H. Worthen.

### GENUS TEREBRATULA, Llhwd.

#### TEREBRATULA ROWLEYI. (sp. nov.)

Shell below the medium size, inequivale, conical; ventral valve strongly convex in the middle from the beak to the basal margin, and rapidly sloping on either side to the lateral borders. Beak of the ventral valve pointed, slightly recurved, and extending beyond that of the opposite valve; both valves longer than broad and sinuate in front. Dorsal valve slightly convex at the umbo, where a shallow depression commences and widens downward, and at the front occupies nearly the entire width of the valve. Surface smooth or showing only very fine lines of growth.

Length of ventral valve from beak to base  $\frac{7}{16}$  inch; greatest breadth  $\frac{6}{16}$  inch; thickness of the shell with the valves united about one-third the length from the beak to the front,  $\frac{1}{4}$  inch.

Position and locality: From a cherty bed near the base of the Burlington limestone, Pike county, Mo.

No. 2526 of the Illinois State collection.  
Collector, R. R. Rowley.

## GENUS ATHYRIS, McCoy.

## ATHYRIS SQUAMOSUS. (sp. nov.)

Shell of medium size, broadly ovate transversely, or nearly circular in outline; valves depressed, and showing externally five heavy imbricating or overlapping plates, that were covered originally with short, coarse spines. Beaks depressed and closely approximate, that of the ventral valve rather the most prominent, and projecting beyond the other, with a perforated extremity.

Length from beak to base  $\frac{4}{6}$  inch; greatest width of the valves  $\frac{1}{6}$  inch; thickness about  $\frac{5}{16}$  inch. This unique form differs so strongly from all others in the Carboniferous formation that a comparison is unnecessary.

Position and locality: Oolitic beds of the St. Louis limestone, Monroe county, Ill.

No. 2527 of the Illinois State collection.

Collector, A. H. Worthen.

## GENUS RHYNCHONELLA, Fischer.

## RHYNCHONELLA ILLINOIENSE. (sp. nov.)

Shell of about medium size, transversely ovate to sub-circular, wider than long, front nearly straight in the middle, beaks obtusely pointed. Ventral valve slightly elevated near the beak, and depressed towards the front into a broad, shallow mesial sinus, which is occupied by about eight sub-angular plications that interlock in front with those of the opposite valve. There are also from eight to ten similar plications on each side of the sinus.

Dorsal valve sharply depressed at the sides, nearly flat from the beak to the front, which is elevated into a broad mesial fold on which there are about eight elevated plications that interlock with those of the opposite valve, and about the same number on each side of the mesial fold. Length of an average size specimen  $\frac{6}{5}$  inch; width  $\frac{1}{2}$  inch; thickness in front about equal to the length. The small individuals of this species, if found in Upper Silurian strata, might be mistaken for *L. Wilsoni*.

Position and locality: Coal Measures, Peoria county, Ill.

No. 2537 of the Illinois State collection.

Collector, Mr. Gifford.

## GENUS LINGULA, Bruguiere.

## LINGULA VARSOVIENSIS. (sp. nov.)

Shell of medium size, longitudinally oblong, more than one-third longer than wide, with sub-parallel sides, the broadest part being a little below the middle of the shell.

Basal margin broadly rounded, beak rather prominent, anterior margin more narrowly rounded than the basal, but not quite perfect in the specimen in hand.

Surface ornamented with numerous concentric striae, or fine lines of growth that are most conspicuous on the borders of the shell.

Length  $\frac{15}{16}$  inch; greatest breadth  $\frac{9}{16}$  inch.

This species resembles in its general form the *L. mytiloides* of the Coal Measures, but differs from that in its uniformly much larger size and relative proportions.

Rare, and hitherto found only in the Warsaw beds of the St. Louis group at Warsaw and near Hamilton, Ill.

No. 2495 of the Illinois State collection.

Collector, A. H. Worthen.

### GENUS LEPETOPSIS, Whitfield. $\times$

#### LEPETOPSIS CHESTERENSIS. (sp. nov.)

Shell of medium size, longitudinally ovate, anterior and posterior portions regularly rounded and about equal in length, a little broader behind than in front, apex pointed, and directed slightly backward, height equal to about one-third the greatest length. A shallow depression or sinus commences immediately behind the apex and increases rapidly in width the posterior margin. Surface ornamented with numerous somewhat irregular sized concentric lines that arch upward in crossing the sinus-like depression behind the apex.

Length  $\frac{9}{16}$  of an inch; greatest breadth  $\frac{7}{16}$  inch; height about  $\frac{3}{16}$  inch.

This species is related to *L. Levetti*, of the Warsaw beds, but may be distinguished by its more elongate form, and the sinus-like depression behind the apex.

Position and locality: Lower division of the Chester limestone, Chester, Ill.

No. 2514 of the Illinois State collection.

Collector, Mrs. J. C. Salter.

### PALÆOCRINOIDEA. Wachs and Spr.

#### GENUS BATOCRINUS, Casseday.

#### BATOCRINUS MONTGOMERYENSIS. (sp. nov.)

Body below the arms spreading into a saucer-like form, more than twice as wide as high, and composed of slightly convex granulose plates. Dome inflated, nearly twice as long as the body below, and composed of nearly flat plates, each of which has a small obtusely pointed node in the center. Ventral tube central and apparently rather slender.

$\times$  By an oversight this genus was omitted in the order Gasteropoda where it belongs.

Basals short and forming a projecting rim around the columnar facet. First radical series  $3 \times 5$ ; the first one hexagonal or heptagonal, nearly twice as wide as long. The second is quadrangular, about the same length as the first, and two-thirds as wide; the third wider than long, axillary, and supporting the first of the secondary series. The anterior ray has three secondary radials in each division. In the postero-lateral rays, the secondary radial series consists of five plates, three on one side and two on the other, the second plate on one side being an axillary plate which supports on each side the tertiary radials.

The antero-lateral rays have two series of secondary radials, consisting of two plates each, the upper one of which is axillary, and supports a double series of tertiary radials.

This gives an arm formula of two arms to the anterior ray, three each to the postero-lateral rays, and four each to the antero-laterals.

First anal plate as wide as long, heptagonal, supporting three plates above in the first series, five in the second, and three in the third, the middle one of the last series projecting about one-half its length above the others.

First interradial about as large as the first anal, and supports two smaller interradials above.

This species in its general form resembles *Batoerinus biturbinate*, but the body is more spreading below the arms, the dome is more inflated, with flat nodose instead of convex plates. Arm openings directed upward.

Position and locality: Keokuk limestone, Montgomery county, Indiana.

The author's collection.

#### BATOCRINUS SUBCONICUS. (sp. nov.)

There is another form occurring near the same horizon as the preceding, which resembles it somewhat in general form, but possessing characters that render it clearly distinct. The calyx is more expanded in proportion to its height than that of *B. Montgomeryensis*, and is composed of flat instead of convex plates, with no projecting rim formed by the basal plates as in that species.

The dome is obtusely conical, composed of convex plates, and twice as long as the calyx below the arms, sloping up regularly and symmetrically into a rather stout, central, ventral tube.

The calyx below the arms is nearly four times as wide as high, with the arm openings directed outward, and arm formula about the same as in *B. Montgomeryensis*. The specimen is so highly silicified that the form and number of the secondary and tertiary radials cannot be clearly determined.

The author's collection.

## POTERIOCRINUS SPINULIFEROUS. (sp. nov.)

Body of medium size, short, width three times as great as the height to the top of the first radials; base depressed, under-basals small and concealed under the first columnar joint. Column obscurely pentagonal near its upper extremity, becoming round below, slender and composed of alternate thin and thicker joints near the base, beyond which it is unknown.

Basal plates forming a flat disk with slightly curving angles above and below, so that the body if detached would rest on the central portion of these plates. First radials short, pentagonal, twice as wide as high, angular below to fill the depressions between the basals. Under a good lens they show rude striations around their lower borders, with a slight depression in the upper margin, forming a well defined suture between them and the second radials. Second radial series on four of the rays as long as their greatest breadth below, angular in front, and compressed at the sides, the apex produced into a rather prominent node, and support on the upper angles the first divisions of the rays. The right antero-lateral ray divides again on the sixth plate, and again on the sixth and twelfth, while the left antero-lateral divides the second time on the sixth plate, and the outer division again on the seventh or eighth plate, while the inner one continues simple beyond the second bifurcation.

The anterior ray has five radial plates, the first corresponding in form and size with those of the other rays, the second is quadrangular, longer than wide, narrower above than below, the third and fourth are quadrangular, about half as long as wide, the fifth is about as long as wide, axillary and produced into a strong node like the axillary plates of the other rays.

The right division of this ray divides again on the tenth plate, while the left continues single as far as it is preserved.

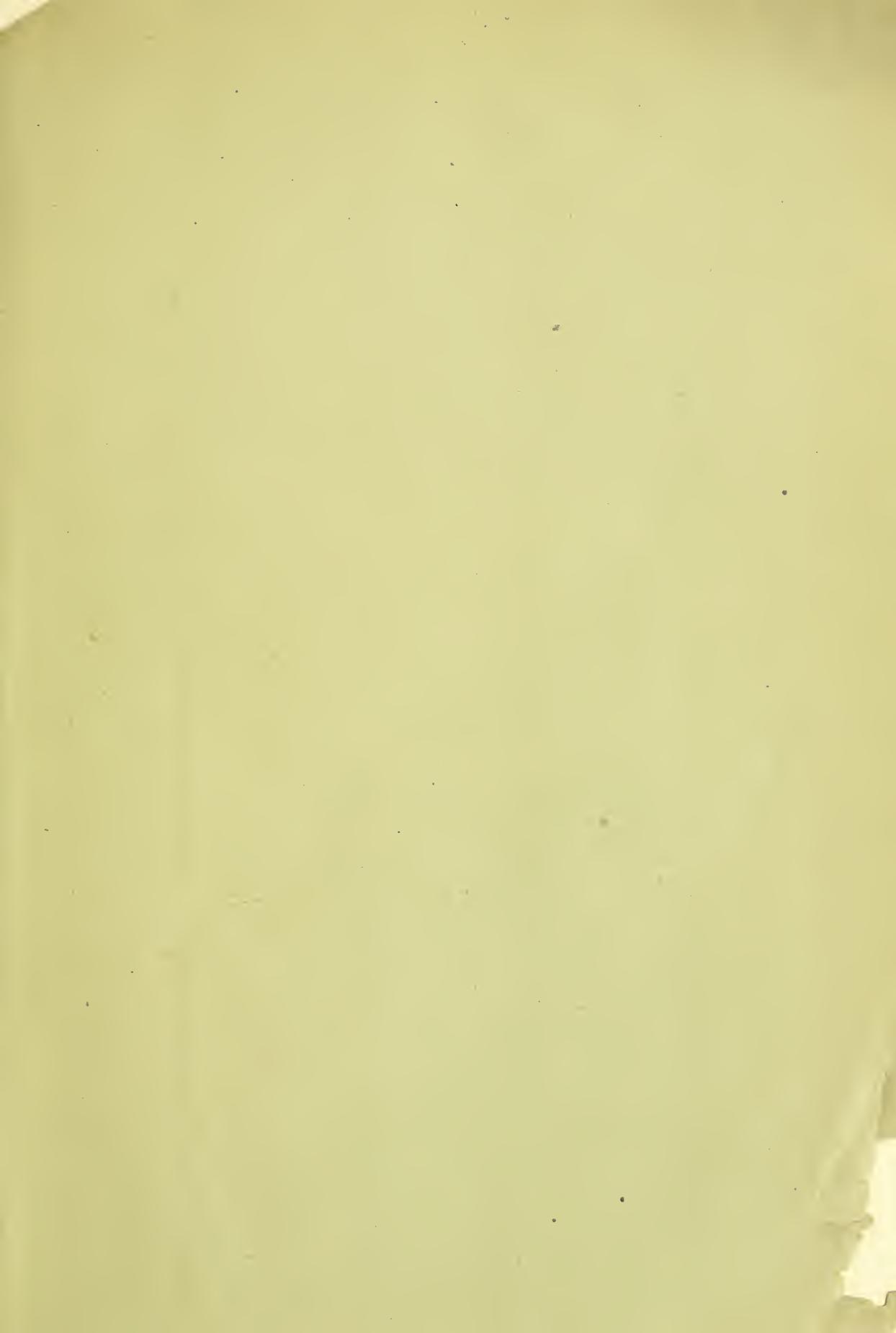
All the axillary plates of the arms are nodose, and longer than the others, which are slightly wedge-formed and give off strong pinnules from their longer sides.

Position and locality: Chester limestone, near Columbia, Monroe county, Ill.

No. 2492 of the Illinois State collection.

Collector, A. H. Worthen.









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